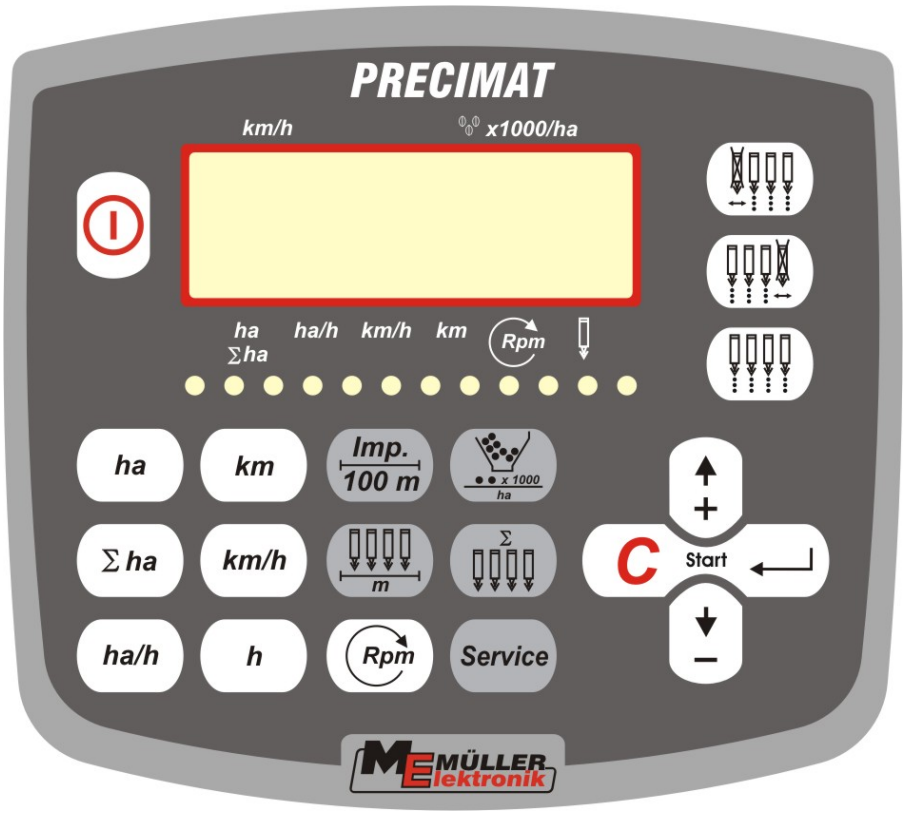
Installation and Operating Instructions

PRECIMAT



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Read and follow these operating instructions.

Keep these operating instructions in a safe place for later reference.

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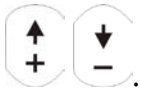
4.2.1.4 Adjustment keys +/-  11

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1 System Description

1.1 System Description

The PRECIMAT contains 2 programs:

- Control unit for precision seed drills (max. 18 aggregates) with seeds counting (optical sensor)
- Area counter for all machines

The PRECIMAT for the precision seed drill consists mainly of:

- the electronic control unit (ECU) (installed in the cabin of the tractor) which serves for the input of values as well as for monitoring. An acoustic and optic alarm is triggered when a malfunction appears.
- the machine junction box (installed on the frame of the precision seed drill) with a connecting cable to the ECU.
- the optical sensors, each one installed at the lower part of the frame of any aggregate with a connecting cable to the junction box.
- The sensor A to detect the driven distance. Installed on the bracket at the driveshaft.

1.2 The PRECIMAT serves for:

1.2.1 Mode “precision seed drill with optical sensor (seeds counting)”

- For the control of the aggregates
  The falling seeds are counted with an optical sensor (infrared-light barrier). Each seed causes an impulse in the computer. The computer monitors the given value for each row. If this value is overstepped or undershot about more than 15 % an acoustic and optic alarm appears. In the display the number of the defective aggregate appears with the number of the seeds/ha (x 1 000). An arrow flashes above the aggregate symbol.

- for determination of the treated area per order.

- for determination of the treated total area per season.

- for indication of the speed

- for determination of the working-time

- for indication of the area output

- for determination of the distance

- with the keys "switch-off of the aggregate-control from left/right" the control of one or more aggregates can be switched-off for a short period of time.

1.2.2 Mode “area-counter”

- for determination of the treated area and total area depending on working-position

- for indication of the speed

- for determination of the working-time

- for indication of the area-performance

- for determination of the distance

- with section-adaptation

The respective mode is done with the key number seeds/ha (see 4.2.2.4 page 12).

2 Safety Instructions

2.1 Disclaimer

The *PRECIMAT* is specified exclusively for agricultural use. The manufacturer takes no responsibility for any installation or application outwith this area.

The manufacturer does not accept liability for damage to persons or property resulting from unspecified use. In such cases all risks are the responsibility of the user.

Specified implementation also includes adhering to the operation and maintenance requirements stipulated by the manufacturer.

Relevant accident prevention regulations as well as other generally recognised safety, industrial, health and road traffic rules are to be adhered to. In addition the manufacturer accepts no liability in cases where arbitrary modifications have been made to the device.

2.2 Safety measures

Warning!

Always pay attention to this symbol for references to important safety precautions.
It means attention! Become alert!
It is a question of your safety.

Read the user's guide before using the PRECIMAT for the first time.

Observe the following recommended precautions and safety instructions:

- Before using the *PRECIMAT,* read and understand this guide. It is of equal importance that other operators also read and understand the manual.
- During maintenance or when using a battery charger, switch off the power supply.
- Never service or repair the device when it is switched on.
- Unauthorised opening of the device leads to the loss of any warranty claims.
- When welding on the tractor or on an attached machine, interrupt the power supply to the *PRECIMAT*.
- Only use a cloth with clear water or a little glass cleaning agent to clean the *PRECIMAT*
- Operate the keys with your finger tips but avoid using finger nails.
- Should any part of this guide remain incomprehensible after reading, contact your dealer or Mueller-Elektronik Service for further clarification before using the *PRECIMAT*
- Read carefully and observe all safety instructions in the manual.
- Learn how to operate the *PRECIMAT* correctly. Do not allow anyone to operate the machine without exact instructions.
- Keep the *PRECIMAT* and the spare parts in good condition. Unstipulated alterations or operation can impair the function and/or safety and affect the life span of the machine.
- Pay attention to **the Safety notice for the subsequent installation of electrical and electronic devices and/or components** in chapter 7.1 page 20 and the **EC Declaration of Conformity** chapter 7.2 page 21 in the appendix of these instructions.

3 Installation instructions - PRECIMAT

3.1 Computer

The computer is to be installed together with the console within the driver's field of vision. The distance from the radio equipment or radio antenna should be at least 1 meter.

3.2 12V socket connection to the tractor battery

For the PRECIMAT's power supply (computer and sensors) the supplied 12V socket is to be connected to the tractor battery. No second device should be connected to this 12V socket. The 12V socket must be protected by a 16A safety fuse, which is to be found in the wire connector to the brown 12 V wire.

Wire colours:

brown	=	+ 12 Volt
blue	=	Ground

The battery's negative pole must always be connected to ground (frame, chassis).

3.3 Machine junction box

The machine junction box and the sensors are factory installed.

3.4 Optical sensor

Important!
Use only the enclosed plug-seal (is to be installed between 4pin. plug and socket).

The cable must be protected against squeezing and other damages.

The left aggreagate is occupied with the number 1 (in driving-direction).

Colours of the wires:	ws	= white	(Ground)
	br	= brown	(+ 12 V)
	gn	= green	(Signal)
	ge	= yellow	(Signal for jump plug)

3.5 Wheel sensor for determination of the driven distance

The magnet is installed with the enclosed M4 x 16 - V4A screws on the wheel. The red side must face the sensor. The sensor is to be mounted to the magnets on the provided bracket at a distance of 5-10 mm. A connector is provided for each wire in the junction box.

4 Operating Instructions

4.1 Initial operation

When switched on, the computer runs through a self-test. After completion the function, used before last switch-off, is automatically selected.

In case of an electronic fault the display shows:
HALP 00 or HALP 88.
In this case return the device for repair.

4.2 Description of the keyboard

The keyboard is devided into 4 parts:
- Input-keys (input/change of data)
- Machine-data keys (setting of the machine-specific parameters)
- Control-keys (switch-on and off of the monitoring)
- Function-keys (indication of the detected dates)

4.2.1 Input-keys

4.2.1.1 Device on/off

By pressing key, the device is switched-on.

Another pressing of and the device is switched-off.

If the supply voltage for example drops below 9 volts when the tractor is started, the computer is switched-off automatically. In this case it must be switched-on again with key.

4.2.1.2 Enter – key

The key serves for the confirmation of data-inputs. Each value of the machine-data that has been changed with the keys has to be confirmed with the key. Otherwise the change is not valid and the computer still works with the old values.

4.2.1.3 "Start-function"

By pressing the keys and at simultaneously the start-function is activated. That means that the counters for area, time and distance are set to 0. The time counting is started again automatically by pressing these keys. This function has to be activated before start of working.

4.2.1.4 Adjustment keys +/-

With the first pressing of the + or. − key the indication jumps one position into the wanted direction.

If you press the key again the indication runs continously until the key is no longer pressed.

4.2.2 Machine-data keys

The computer needs the following data: Impulses/100m, working-width , number of aggregates and the application rate "seeds/ha".

4.2.2.1 "Working-width" key"

This key is used to enter actual working width:

- Press key m
- Select value with the keys + and −
- Press ↵ key

Afterwards the entered value should be checked again by pressing m key.

4.2.2.2 "Impulses/ 100m" key Imp. / 100 m

With this key the number of impulses is entered, which are recorded by the computer from the wheel sensor during a journey of 100 m.

There are two possibilities to enter the data:

1. The Impulses/100 m value is known
   - Press Imp. / 100 m
   - Set the value with + −
   - Press ↵
2. The Impulses/100m value is not known
   - Measure and mark a distance of 100 m on the field
   - Drive the vecilcle to the start position
   - Press Imp. / 100 m and C simultaneously
   - Drive the distance of 100 m
   - Press ↵

4.2.2.3 "Number of aggregates" key

With the keyboard the number of the aggregates selected, that must be monitored.

From 1 - 18 aggregates can be set.

- Press
- Select value with
- Press

4.2.2.4 "Number seeds/ha" key

With this key the working mode is selected.

- Mode precision seed drill (seeds-counting)
  in this case the number of seeds per ha is entered
  (for example 95 000 seeds/ha = enter 95).

- Mode Area-counter
  always a 0 has to be entered, the control of the aggregates is switched-off. The devices can be used as a area-counter.

Input procedure:

- Press
- Select value with
  The value is entered with the factor 1.000 (95.000 seeds/ha = enter 95).
- Press

4.2.2.5 “RPM monitoring“ key

The requirement for monitoring e.g. fan speed, the sensor C must be mounted.

The rpm rate to be monitored must be communicated to the computer.

Enter as follows:

- Start up the machine (normal stress)
- Press
  (current rpm will be displayed).
- Press
  The rated rpm is stored.

If in working position the rated rpm drops more than 15% an alarm is displayed by a hooting sound.

The rpm monitoring is switched off by programming 0 rpm (no shaft rotation or no sensor installed).

4.2.2.6 Service key Service

With this key the service function is selected.

If the light barrier of an optical sensor is interrupted the computer indicates the number of the aggregate and an acoustic alarm appears.

4.2.3 Aggregate keys

4.2.3.1 Switch-off of monitoring of aggregates.

With the keys and a pre-selection is done whether the monitoring of the aggregates shall be switched-off from the left side or from the right side .

The actual switch-off is done with key.

If the drive of the aggregates is switched with an electromagnetic coupling, the aggregate itself will be switched off with switching off the monitoring.

Example:
The machine has 6 aggregates.
Aggregates 1 and 2 shall be switched-off.

Procedure:

- Press key
- The display shows: - 0 - 0
- The left minus sign flashes
- Press key (switch-off line 1)
- The display shows : - 1 - 0
- Press key (switch-off line 2)
- The display shows : - 2 - 0

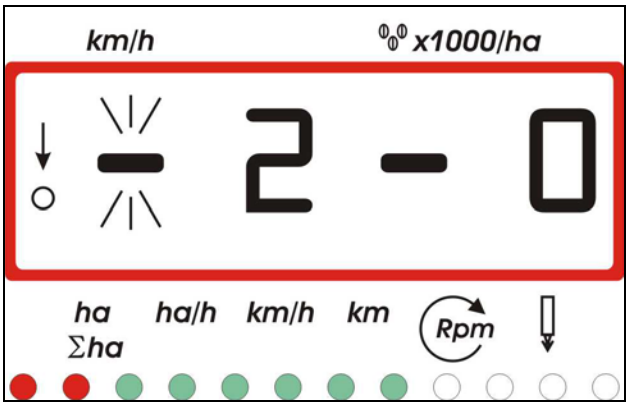


Abb. 4-1 display aggregate-switch-off

Lines 1 and 2 are switched-off

In case of switched-off aggregates the LEDs shine red. If the machine has more than 12 aggregates respectively the 6 outer lines are indicated.

After 20 seconds the working-display appears again. On the left side you see the row number and on the right side the current application rate of seeds(x 1000)/ha.

The flashing circle shows the wheel impulses and the arrow shows the working-position of the machine, that means that the area is counted and the monitoring of the aggregates is activated.

Because of the row 1 and 2 are switched off these are missed out.

Important: If no other key was used in between the pre-selection left is still active and by pressing key other aggregates can be switched-off from left, although if the working-mask is indicated.

At the end of the field, while leaving the working-position (the arrow disappears) the switched-off aggregates and monitoring are switched-on again.

This is also possible by pressing .

4.2.3.2 Switch-on of the monitoring of aggregates

After aggregates have been switched off from the outer side, it is possible to switch them on again from the inner side in the same direction:

The actual switch-on is done with key.

If the drive of the aggregates is switched with an electromagnetic coupling, the aggregate itself will be switched on with switching on the monitoring.

Example:
The machine has 6 aggregates.
Aggregates 1 and 2 shall be switched-on again.

Procedure:

- Press key
- The display shows: - 2 - 0
- The left minus sign flashes
- Press key (switch-on line 2)
- The display shows : - 1 - 0
- Press key (switch-on line 1)
- The display shows : - 0 - 0

The machine is working again with entire working width.

4.2.3.3 Permanent switch-off of aggregates

In addition to switching-off of aggregates from outside to inside every single aggregate can be switched off permanently.

For precision seed drills with up to 12 rows the monitoring and the drive of the aggregates can be switched off permanently. For switching-off the drive of the aggregates an electromagnetic coupling is necessary.

Procedure:
Enter the number of aggregates as described before and proceed with the following steps:

- Keep the key pressed for more than 5 seconds until on the left part of the display a „1“ (row 1) appears. The LED for row 1 (left outside) flashes. The right number can be changed with the keys and .

  0 = permanently switched-off
  1 = permanently switched-on

- Press key
  The LED shines red when row is switched-off and green when row stays switched-on. On the left part of the display a “2” is shown and the second LED starts flashing. The status can be changed again with the keys .
- Repeat this procedure as long as the status of every aggregate has been set correctly.
- After input of the last aggregate the total number of aggregates and the total number of active aggregates is shown on the display.

Caution:
If more than 12 aggregates are used the LEDs are not used!

This setting persists even if the machine is lifted at the end of the field or the computer is switched-off.

It can be suspended by changing the settings or by pressing the key..

Caution:

When pressing the key all switched-off aggregates –which are permanently switched-off aggregates – are switched on again.

To allow a supervision of the permanent switch-off aggregates, the switched-off rows are still counted and shown in the working display (the application rate must be „0“!)

As a consequence of this, the permanent switched-off row must be switched-off again to reach the next row when working on a triangle. When switching on from inside to outside the permanent switched-off row stays switched-off. The advantage of this procedure is, that row by row can be switched without paying attention to permanently switched-off rows.

When the permanent aggregate switch-off is selected again, the last settings are shown again. These can be accepted or changed to the required settings.

4.2.3.4 “Control all aggregates” key

By pressing key the monitoring of all aggregates is switched-on again. All aggregates that were switched-off before are switched-on and monitored. This is also valid for aggregates that have been switched-off permanently.

4.2.4 Function-keys

4.2.4.1 “Hours” key

By pressing the working-time elapsed after activating the start-function is indicated (see chap. 4.2.1.3 page 10). If the tractor is parked and the computer has no power, the time-counting is stopped. After switching-on the device the time-counting is started again. Time-counting can be stopped during work. When has been pressed time-counting can be stopped by pressing again. It starts again, when is pressed once more.

4.2.4.2 "Area" key

With this key the area is shown, which has been worked on since the start function (see chapter 4.2.1.3 Page 10) has been activated. The measurement is stopped as soon as the computer does not receive any wheel impulses. In working mode “0” = Area-counter with sensor Y (working position), this must be switched on.

4.2.4.3 "Total area" key

With this key the total area of a season can be counted. At the beginning of the season the counter can be set to 0 by pressing the keys and simultaneously.

4.2.4.4 "Current area performance" key

Pressing this key the current area performance in ha/h is displayed.

4.2.4.5 “Distance” key

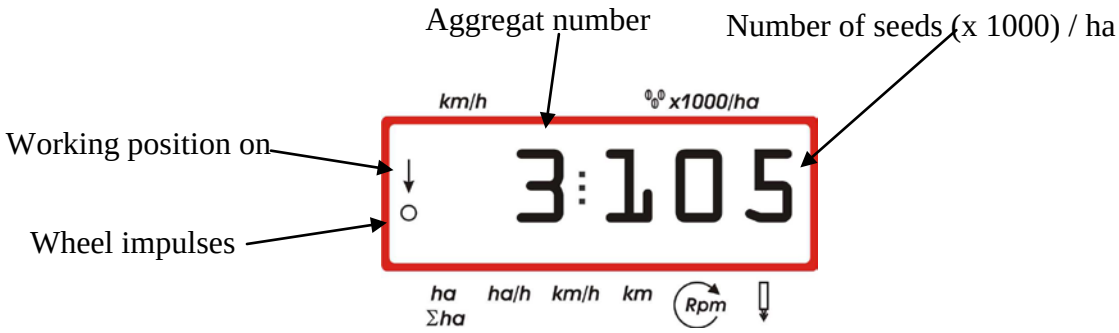
The distance that has been travelled after activating the start-function (see chap. 4.2.1.3 page 10) is displayed.

4.2.4.6 “Speed” key

After pressing this key the current speed is displayed.

4.3 Operating procedure

Display in working condition



After entry of all machine data (see chapter 4.2.2 Page 11) only the start function

(see chapter 4.2.1.3 page 10) must be activated.

During work the current seeds/ha and the aggregate number are displayed. After 5 seconds the display changes automatically to the next aggregate.

When the computer detects a failure, this is displayed. In addition to this the buzzer sounds.

When a function key is pressed, the requested value is displayed for 5 seconds. After this time the computer switches back to the display of “seeds/ha” with aggregate number.

When work is finished all counters can be retrieved and annotated.

5 Maintenance

5.1 Computer

The computer is free of maintenance. During the winter it should be stored in a tempered room.

5.2 Sensors

The optical sensors must be cleaned with a soft brush if they are dirty.

If the dirt cannot be cleaned in dry status the optical sensor has to be cleaned with water with washing-up liquid. Afterwards dry the sensor with a cloth which is free of grease.

The cleaning concerns the internal space of the optical sensor (Infrared-diode and photo transistors).

The wheel sensor is free of maintenance.

6 Error recovery

When trouble-shooting keep to the intended sequence!

	Error	Cause	Measures
6.1	**The device does not switch on**	Polarity reversal of the voltage supply	Check polarity
		Voltage supply interrupted	Check battery connection cable; control battery clamps and fuse
		Total failure	Send in device
6.1.1	**The computer displays HALP 00 or HALP 88**	Memory error	Send in device
6.2	**Speed is not displayed**	Impulses/100m not entered	Enter number of impulses/100m (see 4.2.2.2 page 11)
		The wheel sensor is not sending any impulses to the computer, the ring in the display is not flashing during the journey.	Adjust the distance of the wheel sensor to the magnet to 5-10mm.
			The red side of the magnet must point towards the sensor.
			Secure magnet with a non-magnetic screw.
			Connect cable in the wire harness correctly green = gn = signal brown = br = + 12 volts white = ws = 0 Volt
			Sensor is defective, replace it
			Computer is defective, replace it
			Wire harness is defective, replace it
6.3	**The area is not displayed**	Working width not entered	Enter working width (see 4.2.2.1 page 11)

	Error	Cause	Measures
6.4.	**The selected output-quantity is not indicated. (Number 0 grains/ha)**	Sensors gives no impulses to the computer.	Aggregate defective, Seeds bin is empty
			Optical sensors are dirty, clean well. Before start of the season clean with a soft brush and water with wash-up-liquid. Afterwards dry them
			Connect cable in the distribution box correctly green = gn = Signal brown = br = + 12 Volt white = ws = 0 Volt
			Sensor is defective, change it
			Computer is defective, change it
			Distribution box is defective, change it
6.4.1.	**The indication grains/ha fluctuates**	Optical sensors give irregular impulses	Adjust aggregate correctly, irregular deposition
			Optical sensors are dirty, clean well.
6.5.	**Instead of for exampe 8 aggragates only 4 aggregates are controled**	Entered number of aggregates is incorrect	Enter the number of aggregates(see chap. 4.2.2.3 page 12)
6.6.	**No alarm appears if the aggregate is defective**	Entered number of aggregates is incorrect	Enter the number of aggregates(see chap. 4.2.2.3 page 12)
		Number of seeds is missing	Enter application rate seeds/ha (see 4.2.2.4 page 12)

7 Appendix

7.1 EMC-Supplement to the Operating Guide

Safety notice for the subsequent installation of electrical and electronic devices and/or components

Present-day agricultural machines are equipped with electronic components and devices, whose function can be affected by electromagnetic emission from other devices. These influences can lead to endangerment for individuals when the following safety measures are not adhered to.

When subsequently installing electrical and electronic devices and/or components in a machine with a connection to the electrical system, the user must take sole responsibility for testing the installation for interference with vehicle electronics or other components. This applies in particular to the electronic controls of:

- EHR,
- front lifting gear,
- power take-off shafts,
- engine and
- gears.

Above all it must be ensured that all subsequently installed electrical and electronic components comply with the current version of the EMC directive 89/336/EWG and carry the CE symbol.

In addition the following requirements must be fulfilled when upgrading with mobile communication systems (e.g. radio, telephone):

- Only approved devices complying to national regulations (e.g. BZT approval in Germany) are to be installed;
- The device must be securely installed;
- The use of portable or mobile devices inside the vehicle is permissible only via a connection to the permanently installed outside antenna;
- The transmitting unit is to be installed in a position away from the vehicle electronics;
- An antenna should only be installed professionally ensuring that there is a good earth connection between the antenna and the vehicle chassis.

Please refer to the manufacturer's instructions for cabling and installation as well as for the maximum current consumption.

7.2 EC Declaration of Conformity

This product has been manufactured in conformity with the following national and harmonised standards as specified in the current EMC Directive 89/336/EWG:

- EN ISO 14982